USAV2002-0187 PCTsequence listing.txt
SEQUENCE LISTING

<110> GRUENEBERG, Dorre
BAIN, Gerard
KOTHARI, Nayantara

<120> RETROVIRAL VECTORS FOR DELIVERY OF INTERFERING RNA

<130> USAV2002/0187 PCT

<140> not yet assigned
<141> 2004-10-22

<150> 60/513,313
<151> 2003-10-22

<160> 14

<170> PatentIn version 3.2

<210> 1
<211> 62
<212> DNA
<213> Artificial

<220>
<223> Polylinker Sequence

<400> 1
aattcgactg gcacagcctc caggttcaag agacctggag gctgtgccag tcttttgga 60

aa 62

<210> 2
<211> 62
<212> DNA
<213> Artificial

<220>
<223> Polylinker Sequence

<400> 2
aattcgctgg gactcctttg catgttcaag agacatgcaa aggagtccca gcttttgga 60

aa 62

<210> 3
<211> 62
<212> DNA
<213> Artificial

<220>
<223> Polylinker Sequence

<400> 3
gatccgactg gcacagcctc caggttcaag agacctggag gctgtgccag tcttttgga 60

aa 62

<210> 4

<211> 62
<212> DNA
<213> Artificial

<220>
<223> Polylinker Sequence

<400> 4
gatccgctgg gactcctttg catgttcaag agacatgcaa aggagtccca gctttttgga 60

aa 62

<210> 5
<211> 62
<212> DNA
<213> Artificial

<220>
<223> Polylinker sequence

<400> 5
aattcgactc cagtggtaat ctacttcaag agagtagatt accactggag tcttttgga 60

aa 62

<210> 6
<211> 62
<212> DNA
<213> Artificial

<220>
<223> Polylinker Sequence

<400> 6
gatccgactc cagtggtaat ctacttcaag agagtagatt accactggag tcttttgga 60

aa 62

<210> 7
<211> 241
<212> DNA
<213> Artificial

<220>
<223> U6 Promoter sequence

<400> 7
ttcccatgat tccttcatat ttgcatatac gatacaaggc tgttagagag ataattagaa 60

ttaatttgac tgtaaacaca aagatattag tacaaaatac gtgacgtaga aagtaataat 120

ttcttgggta gtttgcagtt tttaaaatta tgttttaaaa tggactatca tatgcttacc 180

gtaacttgaa agtatttcga tttcttgcct ttatatatct tgtggaaagg acgaaacacc 240

g 241

<210> 8
<211> 6498

<212> DNA
<213> Artificial

<220>
<223> Modified lentivirus (pLenti-U6-Blasti)

<400> 8
aatgtagtct tatgcaatac tcttgtagtc ttgcaacatg gtaacgatga gttagcaaca 60
tgccttacaa ggagagaaaa agcaccgtgc atgccgattg gtggaagtaa ggtggtacga 120
tcgtgcctta ttaggaaggc aacagacggg tctgacatgg attggacgaa ccactgaatt 180
gccgcattgc agagatattg tatttaagtg cctagctcga tacataaacg ggtctctctg 240
gttagaccag atctgagcct gggagctctc tggctaacta gggaacccac tgcttaagcc 300
tcaataaagc ttgccttgag tgcttcaagt agtgtgtgcc cgtctgttgt gtgactctgg 360
taactagaga tccctcagac ccttttagtc agtgtggaaa atctctagca gtggcgcccg 420
aacagggact tgaaagcgaa agggaaacca gaggagctct ctcgacgcag gactcggctt 480
gctgaagcgc gcacggcaag aggcgagggg cggcgactgg tgagtacgcc aaaaattttg 540
actagcggag gctagaagga gagagatggg tgcgagagcg tcagtattaa gcgggggaga 600
attagatcgc gatgggaaaa aattcggtta aggccagggg gaaagaaaaa atataaatta 660
aaacatatag tatgggcaag cagggagcta gaacgattcg cagttaatcc tggcctgtta 720
gaaacatcag aaggctgtag acaaatactg ggacagctac aaccatccct tcagacagga 780
tcagaagaac ttagatcatt atataataca gtagcaaccc tctattgtgt gcatcaaagg 840
atagagataa aagacaccaa ggaagcttta gacaagatag aggaagagca aaacaaaagt 900
aagaccaccg cacagcaagc ggccgctgat cttcagacct ggaggaggag atatgaggga 960
caattggaga agtgaattat ataaatataa agtagtaaaa attgaaccat taggagtagc 1020
acccaccaag gcaaagagaa gagtggtgca gagagaaaaa agagcagtgg gaataggagc 1080
tttgttcctt gggttcttgg gagcagcagg aagcactatg ggcgcagcgt caatgacgct 1140
gacggtacag gccagacaat tattgtctgg tatagtgcag cagcagaaca atttgctgag 1200
ggctattgag gcgcaacagc atctgttgca actcacagtc tggggcatca agcagctcca 1260
ggcaagaatc ctggctgtgg aaagatacct aaaggatcaa cagctcctgg ggatttgggg 1320
ttgctctgga aaactcattt gcaccactgc tgtgccttgg aatgctagtt ggagtaataa 1380
atctctggaa cagatttgga atcacacgac ctggatggag tgggacagag aaattaacaa 1440
ttacacaagc ttaatacact ccttaattga agaatcgcaa aaccagcaag aaaagaatga 1500
acaagaatta ttggaattag ataaatgggc aagtttgtgg aattggttta acataacaaa 1560
ttggctgtgg tatataaaat tattcataat gatagtagga ggcttggtag gtttaagaat 1620
agtttttgct gtactttcta tagtgaatag agttaggcag ggatattcac cattatcgtt 1680

tcagacccac ctcccaaccc cgaggggacc cgacaggccc gaaggaatag aagaagaagg 1740

tggagagaga gacagagaca gatccattcg attagtgaac ggatctcgac ggtaatcgat 1800

tttcccatga ttccttcata tttgcatata cgatacaagg ctgttagaga gataattaga 1860

attaatttga ctgtaaacac aaagatatta gtacaaaata cgtgacgtag aaagtaataa 1920

tttcttgggt agtttgcagt ttttaaaatt atgttttaaa atggactatc atatgcttac 1980

cgtaacttga aagtatttcg atttcttggc tttatatatc ttgtggaaag gacgaaacac 2040

cgaattcacc ggtcggttag taatgagttt ggaattaatt ctgtggaatg tgtgtcagtt 2100

agggtgtgga aagtccccag gctccccagg caggcagaag tatgcaaagc atgcatctca 2160

attagtcagc aaccaggtgt ggaaagtccc caggctcccc agcaggcaga agtatgcaaa 2220

gcatgcatct caattagtca gcaaccatag tcccgcccct aactccgccc atcccgcccc 2280

taactccgcc cagttccgcc cattctccgc cccatggctg actaattttt tttatttatg 2340

cagaggccga ggccgcctct gcctctgagc tattccagaa gtagtgagga ggcttttttg 2400

gaggcctagg cttttgcaaa aagctcccgg gagcttgtat atccattttc ggatctgatc 2460

agcacgtgtt gacaattaat catcggcata gtatatcggc atagtataat acgacaaggt 2520

gaggaactaa accatggcca agcctttgtc tcaagaagaa tccaccctca ttgaaagagc 2580

aacggctaca atcaacagca tccccatctc tgaagactac agcgtcgcca gcgcagctct 2640

ctctagcgac ggccgcatct tcactggtgt caatgtatat cattttactg ggggaccttg 2700

tgcagaactc gtggtgctgg gcactgctgc tgctgcggca gctggcaacc tgacttgtat 2760

cgtcgcgatc ggaaatgaga acaggggcat cttgagcccc tgcggacggt gccgacaggt 2820

gcttctcgat ctgcatcctg ggatcaaagc catagtgaag gacagtgatg gacagccgac 2880

ggcagttggg attcgtgaat tgctgccctc tggttatgtg tgggagggct aagcacaatt 2940

cgagctcggt acctttaaga ccaatgactt acaaggcagc tgtagatctt agccactttt 3000

taaaagaaaa ggggggactg gaagggctaa ttcactccca acgaagacaa gatctgcttt 3060

ttgcttgtac tgggtctctc tggttagacc agatctgagc ctgggagctc tctggctaac 3120

tagggaaccc actgcttaag cctcaataaa gcttgccttg agtgcttcaa gtagtgtgtg 3180

cccgtctgtt gtgtgactct ggtaactaga gatccctcag acccttttag tcagtgtgga 3240

aaatctctag cagtagtagt tcatgtcatc ttattattca gtatttataa cttgcaaaga 3300

aatgaatatc agagagtgag aggaacttgt ttattgcagc ttataatggt tacaaataaa 3360

gcaatagcat cacaaatttc acaaataaag catttttttc actgcattct agttgtggtt 3420

tgtccaaact catcaatgta tcttatcatg tctggctcta gctatcccgc ccctaactcc 3480

gcccatcccg cccctaactc cgcccagttc cgcccattct ccgccccatg gctgactaat 3540

ttttttttatt tatgcagagg ccgaggccgc ctcggcctct gagctattcc agaagtagtg 3600

aggaggcttt tttggaggcc tagggacgta cccaattcgc cctatagtga gtcgtattac 3660
gcgcgctcac tggccgtcgt tttacaacgt cgtgactggg aaaaccctgg cgttacccaa 3720
cttaatcgcc ttgcagcaca tccccctttc gccagctggc gtaatagcga agaggcccgc 3780
accgatcgcc cttcccaaca gttgcgcagc ctgaatggcg aatgggacgc gccctgtagc 3840
ggcgcattaa gcgcggcggg tgtggtggtt acgcgcagcg tgaccgctac acttgccagc 3900
gccctagcgc ccgctccttt cgctttcttc ccttcctttc tcgccacgtt cgccggcttt 3960
ccccgtcaag ctctaaatcg ggggctccct ttagggttcc gatttagtgc tttacggcac 4020
ctcgacccca aaaaacttga ttagggtgat ggttcacgta gtgggccatc gccctgatag 4080
acggtttttc gccctttgac gttggagtcc acgttcttta atagtggact cttgttccaa 4140
actggaacaa cactcaaccc tatctcggtc tattcttttg atttataagg gattttgccg 4200
atttcggcct attggttaaa aaatgagctg atttaacaaa aatttaacgc gaattttaac 4260
aaaatattaa cgcttacaat ttaggtggca cttttcgggg aaatgtgcgc ggaacccta 4320
tttgtttatt tttctaaata cattcaaata tgtatccgct catgagacaa taaccctgat 4380
aaatgcttca ataatattga aaaaggaaga gtatgagtat tcaacatttc cgtgtcgccc 4440
ttattccctt ttttgcggca ttttgccttc ctgtttttgc tcacccagaa acgctggtga 4500
aagtaaaaga tgctgaagat cagttgggtg cacgagtggg ttacatcgaa ctggatctca 4560
acagcggtaa gatccttgag agttttcgcc ccgaagaacg ttttccaatg atgagcactt 4620
ttaaagttct gctatgtggc gcggtattat cccgtattga cgccgggcaa gagcaactcg 4680
gtcgccgcat acactattct cagaatgact tggttgagta ctcaccagtc acagaaaagc 4740
atcttacgga tggcatgaca gtaagagaat tatgcagtgc tgccataacc atgagtgata 4800
acactgcggc caacttactt ctgacaacga tcggaggacc gaaggagcta accgcttttt 4860
tgcacaacat gggggatcat gtaactcgcc ttgatcgttg ggaaccggag ctgaatgaag 4920
ccataccaaa cgacgagcgt gacaccacga tgcctgtagc aatggcaaca acgttgcgca 4980
aactattaac tggcgaacta cttactctag cttcccggca acaattaata gactggatgg 5040
aggcggataa agttgcagga ccacttctgc gctcggccct tccggctggc tggtttattg 5100
ctgataaatc tggagccggt gagcgtgggt ctcgcggtat cattgcagca ctggggccag 5160
atggtaagcc ctcccgtatc gtagttatct acacgacggg gagtcaggca actatggatg 5220
aacgaaatag acagatcgct gagataggtg cctcactgat taagcattgg taactgtcag 5280
accaagttta ctcatatata ctttagattg atttaaaact tcatttttaa tttaaaagga 5340
tctaggtgaa gatccttttt gataatctca tgaccaaaat cccttaacgt gagttttcgt 5400
tccactgagc gtcagacccc gtagaaaaga tcaaaggatc ttcttgagat cctttttttc 5460

tgcgcgtaat ctgctgcttg caaacaaaaa aaccaccgct accagcggtg gtttgtttgc 5520

cggatcaaga gctaccaact ctttttccga aggtaactgg cttcagcaga gcgcagatac 5580

caaatactgt tcttctagtg tagccgtagt taggccacca cttcaagaac tctgtagcac 5640

cgcctacata cctcgctctg ctaatcctgt taccagtggc tgctgccagt ggcgataagt 5700

cgtgtcttac cgggttggac tcaagacgat agttaccgga taaggcgcag cggtcgggct 5760

gaacgggggg ttcgtgcaca gcccagct tggagcgaac gacctacacc gaactgagat 5820

acctacagcg tgagctatga gaaagcgcca cgcttcccga agggagaaag gcggacaggt 5880

atccggtaag cggcagggtc ggaacaggag agcgcacgag ggagcttcca gggggaaacg 5940

cctggtatct ttatagtcct gtcgggtttc gccacctctg acttgagcgt cgatttttgt 6000

gatgctcgtc agggggggcgg agcctatgga aaaacgccag caacgcggcc tttttacggt 6060

tcctggcctt ttgctggcct tttgctcaca tgttctttcc tgcgttatcc cctgattctg 6120

tggataaccg tattaccgcc tttgagtgag ctgataccgc tcgccgcagc cgaacgaccg 6180

agcgcagcga gtcagtgagc gaggaagcgg aagagcgccc aatacgcaaa ccgcctctcc 6240

ccgcgcgttg gccgattcat taatgcagct ggcacgacag gtttcccgac tggaaagcgg 6300

gcagtgagcg caacgcaatt aatgtgagtt agctcactca ttaggcaccc caggctttac 6360

actttatgct tccggctcgt atgttgtgtg gaattgtgag cggataacaa tttcacacag 6420

gaaacagcta tgaccatgat tacgccaagc gcgcaattaa ccctcactaa agggaacaaa 6480

agctggagct gcaagctt 6498

<210> 9
<211> 6702
<212> DNA
<213> Artificial

<220>
<223> Modified Lentivirus (pLenti-U6-hrGFP)

<400> 9
aatgtagtct tatgcaatac tcttgtagtc ttgcaacatg gtaacgatga gttagcaaca 60

tgccttacaa ggagagaaaa agcaccgtgc atgccgattg gtggaagtaa ggtggtacga 120

tcgtgcctta ttaggaaggc aacagacggg tctgacatgg attggacgaa ccactgaatt 180

gccgcattgc agagatattg tatttaagtg cctagctcga tacataaacg ggtctctctg 240

gttagaccag atctgagcct gggagctctc tggctaacta gggaacccac tgcttaagcc 300

tcaataaagc ttgccttgag tgcttcaagt agtgtgtgcc cgtctgttgt gtgactctgg 360

taactagaga tccctcagac ccttttagtc agtgtggaaa atctctagca gtggcgcccg 420

aacagggact tgaaagcgaa agggaaacca gaggagctct ctcgacgcag gactcggctt 480

gctgaagcgc gcacggcaag aggcgagggg cggcgactgg tgagtacgcc aaaaattttg 540

actagcggag gctagaagga gagagatggg tgcgagagcg tcagtattaa gcgggggaga 600
attagatcgc gatgggaaaa aattcggtta aggccagggg gaaagaaaaa atataaatta 660
aaacatatag tatgggcaag cagggagcta gaacgattcg cagttaatcc tggcctgtta 720
gaaacatcag aaggctgtag acaaatactg ggacagctac aaccatccct tcagacagga 780
tcagaagaac ttagatcatt atataataca gtagcaaccc tctattgtgt gcatcaaagg 840
atagagataa aagacaccaa ggaagcttta gacaagatag aggaagagca aaacaaaagt 900
aagaccaccg cacagcaagc ggccgctgat cttcagacct ggaggaggag atatgaggga 960
caattggaga agtgaattat ataaatataa agtagtaaaa attgaaccat taggagtagc 1020
acccaccaag gcaaagagaa gagtggtgca gagagaaaaa agagcagtgg gaataggagc 1080
tttgttcctt gggttcttgg gagcagcagg aagcactatg ggcgcagcgt caatgacgct 1140
gacggtacag gccagacaat tattgtctgg tatagtgcag cagcagaaca atttgctgag 1200
ggctattgag gcgcaacagc atctgttgca actcacagtc tggggcatca agcagctcca 1260
ggcaagaatc ctggctgtgg aaagatacct aaaggatcaa cagctcctgg ggatttgggg 1320
ttgctctgga aaactcattt gcaccactgc tgtgccttgg aatgctagtt ggagtaataa 1380
atctctggaa cagatttgga atcacacgac ctggatggag tgggacagag aaattaacaa 1440
ttacacaagc ttaatacact ccttaattga agaatcgcaa aaccagcaag aaaagaatga 1500
acaagaatta ttggaattag ataaatgggc aagtttgtgg aattggttta acataacaaa 1560
ttggctgtgg tatataaaat tattcataat gatagtagga ggcttggtag gtttaagaat 1620
agtttttgct gtactttcta tagtgaatag agttaggcag ggatattcac cattatcgtt 1680
tcagacccac ctcccaaccc cgaggggacc cgacaggccc gaaggaatag aagaagaagg 1740
tggagagaga gacagagaca gatccattcg attagtgaac ggatctcgac ggtaatcgat 1800
tttcccatga ttccttcata tttgcatata cgatacaagg ctgttagaga gataattaga 1860
attaatttga ctgtaaacac aaagatatta gtacaaaata cgtgacgtag aaagtaataa 1920
tttcttgggt agtttgcagt ttttaaaatt atgttttaaa atggactatc atatgcttac 1980
cgtaacttga aagtatttcg atttcttggc tttatatatc ttgtggaaag gacgaaacac 2040
cgaattcacc ggtcggttag taatgagttt ggaattaatt ctgtggaatg tgtgtcagtt 2100
agggtgtgga aagtccccag gctccccagg caggcagaag tatgcaaagc atgcatctca 2160
attagtcagc aaccaggtgt ggaaagtccc caggctcccc agcaggcaga agtatgcaaa 2220
gcatgcatct caattagtca gcaaccatag tcccgcccct aactccgccc atcccgcccc 2280
taactccgcc cagttccgcc cattctccgc cccatggctg actaattttt tttatttatg 2340
cagaggccga ggccgcctct gcctctgagc tattccagaa gtagtgagga ggcttttttg 2400

gaggcctagg cttttgcaaa aagctcccgg gatggtgagc aagcagatcc tgaagaacac 2460
cggcctgcag gagatcatga gcttcaaggt gaacctggag ggcgtggtga acaaccacgt 2520
gttcaccatg gagggctgcg gcaagggcaa catcctgttc ggcaaccagc tggtgcagat 2580
ccgcgtgacc aagggcgccc ccctgccctt cgccttcgac atcctgagcc ccgccttcca 2640
gtacggcaac cgcaccttca ccaagtaccc cgaggacatc agcgacttct tcatccagag 2700
cttccccgcc ggcttcgtgt acgagcgcac cctgcgctac gaggacggcg gcctggtgga 2760
gatccgcagc gacatcaacc tgatcgagga gatgttcgtg taccgcgtgg agtacaaggg 2820
ccgcaacttc cccaacgacg gccccgtgat gaagaagacc atcaccggcc tgcagcccag 2880
cttcgaggtg gtgtacatga acgacggcgt gctggtgggc caggtgatcc tggtgtaccg 2940
cctgaacagc ggcaagttct acagctgcca catgcgcacc ctgatgaaga gcaagggcgt 3000
ggtgaaggac ttccccgagt accacttcat ccagcaccgc ctggagaaga cctacgtgga 3060
ggacggcggc ttcgtggagc agcacgagac cgccatcgcc cagctgacca gcctgggcaa 3120
gcccctgggc agcctgcacg agtgggtgta aggtaccttt aagaccaatg acttacaagg 3180
cagctgtaga tcttagccac tttttaaaag aaaaggggg actggaaggg ctaattcact 3240
cccaacgaag acaagatctg ctttttgctt gtactgggtc tctctggtta gaccagatct 3300
gagcctggga gctctctggc taactaggga acccactgct taagcctcaa taaagcttgc 3360
cttgagtgct tcaagtagtg tgtgcccgtc tgttgtgtga ctctggtaac tagagatccc 3420
tcagaccctt ttagtcagtg tggaaaatct ctagcagtag tagttcatgt catcttatta 3480
ttcagtattt ataacttgca aagaaatgaa tatcagagag tgagaggaac ttgtttattg 3540
cagcttataa tggttacaaa taaagcaata gcatcacaaa tttcacaaat aaagcatttt 3600
tttcactgca ttctagttgt ggtttgtcca aactcatcaa tgtatcttat catgtctggc 3660
tctagctatc ccgcccctaa ctccgcccat cccgccccta actccgccca gttccgccca 3720
ttctccgccc catggctgac taatttttt tatttatgca gaggccgagg ccgcctcggc 3780
ctctgagcta ttccagaagt agtgaggagg ctttttttgga ggcctaggga cgtacccaat 3840
tcgccctata gtgagtcgta ttacgcgcgc tcactggccg tcgttttaca acgtcgtgac 3900
tgggaaaacc ctggcgttac ccaacttaat cgccttgcag cacatccccc tttcgccagc 3960
tggcgtaata gcgaagaggc ccgcaccgat cgcccttccc aacagttgcg cagcctgaat 4020
ggcgaatggg acgcgccctg tagcggcgca ttaagcgcgg cgggtgtggt ggttacgcgc 4080
agcgtgaccg ctacacttgc cagcgcccta gcgcccgctc ctttcgcttt cttcccttcc 4140
tttctcgcca cgttcgccgg ctttccccgt caagctctaa atcgggggct ccctttaggg 4200
ttccgattta gtgctttacg gcacctcgac cccaaaaaac ttgattaggg tgatggttca 4260
cgtagtgggc catcgccctg atagacggtt tttcgccctt tgacgttgga gtccacgttc 4320

tttaatagtg gactcttgtt ccaaactgga acaacactca accctatctc ggtctattct 4380
tttgatttat aagggatttt gccgatttcg gcctattggt taaaaaatga gctgatttaa 4440
caaaaattta acgcgaattt taacaaaata ttaacgctta caatttaggt ggcacttttc 4500
ggggaaatgt gcgcggaacc cctatttgtt tatttttcta atacattca aatatgtatc 4560
cgctcatgag acaataaccc tgataaatgc ttcaataata ttgaaaaagg aagagtatga 4620
gtattcaaca tttccgtgtc gcccttattc cctttttgc ggcattttgc cttcctgttt 4680
ttgctcaccc agaaacgctg gtgaaagtaa aagatgctga agatcagttg ggtgcacgag 4740
tgggttacat cgaactggat ctcaacagcg gtaagatcct tgagagtttt cgccccgaag 4800
aacgttttcc aatgatgagc acttttaaag ttctgctatg tggcgcggta ttatcccgta 4860
ttgacgccgg gcaagagcaa ctcggtcgcc gcatacacta ttctcagaat gacttggttg 4920
agtactcacc agtcacagaa aagcatctta cggatggcat gacagtaaga gaattatgca 4980
gtgctgccat aaccatgagt gataacactg cggccaactt acttctgaca acgatcggag 5040
gaccgaagga gctaaccgct tttttgcaca acatggggga tcatgtaact cgccttgatc 5100
gttgggaacc ggagctgaat gaagccatac caaacgacga gcgtgacacc acgatgcctg 5160
tagcaatggc aacaacgttg cgcaaactat taactggcga actacttact ctagcttccc 5220
ggcaacaatt aatagactgg atggaggcgg ataaagttgc aggaccactt ctgcgctcgg 5280
cccttccggc tggctggttt attgctgata aatctggagc cggtgagcgt gggtctcgcg 5340
gtatcattgc agcactgggg ccagatggta agccctcccg tatcgtagtt atctacacga 5400
cggggagtca ggcaactatg gatgaacgaa atagacagat cgctgagata ggtgcctcac 5460
tgattaagca ttggtaactg tcagaccaag tttactcata tatactttag attgatttaa 5520
aacttcattt ttaatttaaa aggatctagg tgaagatcct ttttgataat ctcatgacca 5580
aaatccctta acgtgagttt tcgttccact gagcgtcaga ccccgtagaa aagatcaaag 5640
gatcttcttg agatcctttt tttctgcgcg taatctgctg cttgcaaaca aaaaaaccac 5700
cgctaccagc ggtggtttgt ttgccggatc aagagctacc aactcttttt ccgaaggtaa 5760
ctggcttcag cagagcgcag ataccaaata ctgttcttct agtgtagccg tagttaggcc 5820
accacttcaa gaactctgta gcaccgccta catacctcgc tctgctaatc ctgttaccag 5880
tggctgctgc cagtggcgat aagtcgtgtc ttaccgggtt ggactcaaga cgatagttac 5940
cggataaggc gcagcggtcg ggctgaacgg ggggttcgtg cacacagccc agcttggagc 6000
gaacgaccta caccgaactg agatacctac agcgtgagct atgagaaagc gccacgcttc 6060
ccgaagggag aaaggcggac aggtatccgg taagcggcag ggtcggaaca ggagagcgca 6120
cgagggagct tccaggggga aacgcctggt atctttatag tcctgtcggg tttcgccacc 6180

tctgacttga gcgtcgattt ttgtgatgct cgtcaggggg gcggagccta tggaaaaacg 6240

ccagcaacgc ggccttttta cggttcctgg ccttttgctg gccttttgct cacatgttct 6300

ttcctgcgtt atcccctgat tctgtggata accgtattac cgcctttgag tgagctgata 6360

ccgctcgccg cagccgaacg accgagcgca gcgagtcagt gagcgaggaa gcggaagagc 6420

gcccaatacg caaaccgcct ctccccgcgc gttggccgat tcattaatgc agctggcacg 6480

acaggtttcc cgactggaaa gcgggcagtg agcgcaacgc aattaatgtg agttagctca 6540

ctcattaggc accccaggct ttacacttta tgcttccggc tcgtatgttg tgtggaattg 6600

tgagcggata acaatttcac acaggaaaca gctatgacca tgattacgcc aagcgcgcaa 6660

ttaaccctca ctaaagggaa caaaagctgg agctgcaagc tt 6702

<210> 10
<211> 7244
<212> DNA
<213> Artificial

<220>
<223> MSCV vector (MSCV-U6-Hygro)

<400> 10
tgaaagaccc cacctgtagg tttggcaagc tagcttaagt aacgccattt tgcaaggcat 60

ggaaaataca taactgagaa tagagaagtt cagatcaagg ttaggaacag agagacagca 120

gaatatgggc caaacaggat atctgtggta agcagttcct gccccggctc agggccaaga 180

acagatggtc cccagatgcg gtcccgccct cagcagtttc tagagaacca tcagatgttt 240

ccagggtgcc ccaaggacct gaaatgaccc tgtgccttat ttgaactaac caatcagttc 300

gcttctcgct tctgttcgcg cgcttctgct ccccgagctc aataaaagag cccacaaccc 360

ctcactcggc gcgccagtcc tccgatagac tgcgtcgccc gggtacccgt attcccaata 420

aagcctcttg ctgtttgcat ccgaatcgtg gactcgctga tccttgggag ggtctcctca 480

gattgattga ctgcccacct cgggggtctt tcatttggag gttccaccga gatttggaga 540

cccctgccca gggaccaccg acccccccgc cgggaggtaa gctggccagc ggtcgtttcg 600

tgtctgtctc tgtctttgtg cgtgtttgtg ccggcatcta atgtttgcgc ctgcgtctgt 660

actagttagc taactagctc tgtatctggc ggacccgtgg tggaactgac gagttctgaa 720

cacccggccg caaccctggg agacgtccca gggactttgg gggccgtttt tgtggcccga 780

cctgaggaag ggagtcgatg tggaatccga ccccgtcagg atatgtggtt ctggtaggag 840

acgagaacct aaaacagttc ccgcctccgt ctgaattttt gctttcggtt tggaaccgaa 900

gccgcgcgtc ttgtctgctg cagcgctgca gcatcgttct gtgttgtctc tgtctgactg 960

tgtttctgta tttgtctgaa aattagggcc agactgttac cactccctta agtttgacct 1020

taggtcactg gaaagatgtc gagcggatcg ctcacaacca gtcggtagat gtcaagaaga 1080

gacgttgggt taccttctgc tctgcagaat ggccaacctt taacgtcgga tggccgcgag 1140
acggcacctt taaccgagac ctcatcaccc aggttaagat caaggtcttt tcacctggcc 1200
cgcatggaca cccagaccag gtcccctaca tcgtgacctg ggaagccttg gcttttgacc 1260
cccctccctg ggtcaagccc tttgtacacc ctaagcctcc gcctcctctt cctccatccg 1320
ccccgtctct ccccccttgaa cctcctcgtt cgaccccgcc tcgtatcctc cctttatcca 1380
gccctcactc cttctctagg cgccggaatt agatctttcc catgattcct tcatatttgc 1440
atatacgata caaggctgtt agagagataa ttagaattaa tttgactgta aacacaaaga 1500
tattagtaca aaatacgtga cgtagaaagt aataatttct tgggtagttt gcagttttta 1560
aaattatgtt ttaaaatgga ctatcatatg cttaccgtaa cttgaaagta tttcgatttc 1620
ttggctttat atatcttgtg gaaaggacga aacacctctg aggttaacgg atccgcggcc 1680
gcacgcgtgt taacgaattc taccgggtag gggaggcgct tttcccaagg cagtctggag 1740
catgcgcttt agcagccccg ctgggcactt ggcgctacac aagtggcctc tggcctcgca 1800
cacattccac atccaccggt aggcgccaac cggctccgtt ctttggtggc cccttcgcgc 1860
caccttctac tcctccccta gtcaggaagt tccccccccgc cccgcagctc gcgtcgtgca 1920
ggacgtgaca aatggaagta gcacgtctca ctagtctcgt gcagatggac agcaccgctg 1980
agcaatggaa gcgggtaggc ctttggggca gcggccaata gcagctttgc tccttcgctt 2040
tctgggctca gaggctggga aggggtgggt ccgggggcgg gctcaggggc gggctcaggg 2100
gcggggcggg cgcccgaagg tcctccggag gcccggcatt ctgcacgctt caaaagcgca 2160
cgtctgccgc gctgttctcc tcttcctcat ctccgggcct ttcgacctgc atcccgccac 2220
catgaaaaag cctgaactca ccgcgacgtc tgtcgagaag tttctgatcg aaaagttcga 2280
cagcgtctcc gacctgatgc agctctcgga gggcgaagaa tctcgtgctt tcagcttcga 2340
tgtaggaggg cgtggatatg tcctgcgggt aaatagctgc gccgatggtt tctacaaaga 2400
tcgttatgtt tatcggcact ttgcatcggc cgcgctcccg attccggaag tgcttgacat 2460
tggggaattc agcgagagcc tgacctattg catctcccgc cgtgcacagg gtgtcacgtt 2520
gcaagacctg cctgaaaccg aactgcccgc tgttctgcag ccggtcgcgg aggccatgga 2580
tgcgatcgct gcggccgatc ttagccagac gagcgggttc ggcccattcg gaccgcaagg 2640
aatcggtcaa tacactacat ggcgtgattt catatgcgcg attgctgatc cccatgtgta 2700
tcactggcaa actgtgatgg acgacaccgt cagtgcgtcc gtcgcgcagg ctctcgatga 2760
gctgatgctt tgggccgagg actgccccga agtccggcac ctcgtgcacg cggatttcgg 2820
ctccaacaat gtcctgacgg acaatggccg cataacagcg gtcattgact ggagcgaggc 2880
gatgttcggg gattcccaat acgaggtcgc caacatcttc ttctggaggc cgtggttggc 2940

ttgtatggag cagcagacgc gctacttcga gcggaggcat ccggagcttg caggatcgcc 3000
gcggctccgg ggcgtatatg ctccgcattg gtcttgacca actctatcag agcttggttg 3060
acggcaattt cgatgatgca gcttgggcgc agggtcgatg cgacgcaatc gtccgatccg 3120
gagccgggac tgtcgggcgt acacaaatcg cccgcagaag cgcggccgtc tggaccgatg 3180
gctgtgtaga agtactcgcc gatagtggaa accgacgccc cagcactcgt ccgagggcaa 3240
aggaatagag tagatgccga ccgaacaaga gctgatttcg agaacgcctc agccagcaac 3300
tcgcgcgagc ctagcaaggc aaatgcgaga gaacggcctt acgcttggtg gcacagttct 3360
cgtccacagt tcgctaagct cgctcggctg ggtcgcggga gggccggtcg cagtgattca 3420
ggcccttctg gattgtgttg gtccccaggg cacgattgtc atgcccacgc actcgggtga 3480
tctgactgat cccgcagatt ggagatcgcc gcccgtgcct gccgattggg tgcagatccg 3540
tcgacctgca gccaagctta tcgataaaat aaaagatttt atttagtctc cagaaaaagg 3600
ggggaatgaa agaccccacc tgtaggtttg gcaagctagc ttaagtaacg ccattttgca 3660
aggcatggaa aatacataac tgagaataga gaagttcaga tcaaggttag gaacagagag 3720
acagcagaat atgggccaaa caggatatct gtggtaagca gttcctgccc cggctcaggg 3780
ccaagaacag atggtcccca gatgcggtcc cgccctcagc agtttctaga gaaccatcag 3840
atgtttccag ggtgccccaa ggacctgaaa tgaccctgtg ccttatttga actaaccaat 3900
cagttcgctt ctcgcttctg ttcgcgcgct tctgctcccc gagctcaata aaagagccca 3960
caacccctca ctcggcgcgc cagtcctccg atagactgcg tcgcccgggt acccgtgtat 4020
ccaataaacc ctcttgcagt tgcatccgac ttgtggtctc gctgttcctt gggagggtct 4080
cctctgagtg attgactacc cgtcagcggg ggtctttcat gggtaacagt ttcttgaagt 4140
tggagaacaa cattctgagg gtaggagtcg aatattaagt aatcctgact caattagcca 4200
ctgttttgaa tccacatact ccaatactcc tgaaatagtt cattatggac agcgcagaag 4260
agctggggag aattaattcg taatcatggt catagctgtt tcctgtgtga aattgttatc 4320
cgctcacaat tccacacaac atacgagccg gaagcataaa gtgtaaagcc tggggtgcct 4380
aatgagtgag ctaactcaca ttaattgcgt tgcgctcact gcccgctttc agtcgggaa 4440
acctgtcgtg ccagctgcat taatgaatcg gccaacgcgc ggggagaggc ggtttgcgta 4500
ttgggcgctc ttccgcttcc tcgctcactg actcgctgcg ctcggtcgtt cggctgcggc 4560
gagcggtatc agctcactca aaggcggtaa tacggttatc cacagaatca ggggataacg 4620
caggaaagaa catgtgagca aaaggccagc aaaaggccag gaaccgtaaa aaggccgcgt 4680
tgctggcgtt tttccatagg ctccgccccc ctgacgagca tcacaaaaat cgacgctcaa 4740
gtcagaggtg gcgaaacccg acaggactat aaagatacca ggcgtttccc cctggaagct 4800
ccctcgtgcg ctctcctgtt ccgaccctgc cgcttaccgg atacctgtcc gcctttctcc 4860

cttcgggaag cgtggcgctt tctcatagct cacgctgtag gtatctcagt tcggtgtagg 4920
tcgttcgctc caagctgggc tgtgtgcacg aacccccgt tcagcccgac cgctgcgcct 4980
tatccggtaa ctatcgtctt gagtccaacc cggtaagaca cgacttatcg ccactggcag 5040
cagccactgg taacaggatt agcagagcga ggtatgtagg cggtgctaca gagttcttga 5100
agtggtggcc taactacggc tacactagaa ggacagtatt tggtatctgc gctctgctga 5160
agccagttac cttcggaaaa agagttggta gctcttgatc cggcaaacaa accaccgctg 5220
gtagcggtgg ttttttgtt tgcaagcagc agattacgcg cagaaaaaaa ggatctcaag 5280
aagatccttt gatcttttct acggggtctg acgctcagtg gaacgaaaac tcacgttaag 5340
ggattttggt catgagatta tcaaaaagga tcttcaccta gatcctttta aattaaaaat 5400
gaagttttaa atcaatctaa agtatatatg agtaaacttg gtctgacagt taccaatgct 5460
taatcagtga ggcacctatc tcagcgatct gtctatttcg ttcatccata gttgcctgac 5520
tccccgtcgt gtagataact acgatacggg agggcttacc atctggcccc agtgctgcaa 5580
tgataccgcg agacccacgc tcaccggctc cagatttatc agcaataaac cagccagccg 5640
gaagggccga gcgcagaagt ggtcctgcaa ctttatccgc ctccatccag tctattaatt 5700
gttgccggga agctagagta agtagttcgc cagttaatag tttgcgcaac gttgttgcca 5760
ttgctacagg catcgtggtg tcacgctcgt cgtttggtat ggcttcattc agctccggtt 5820
cccaacgatc aaggcgagtt acatgatccc ccatgttgtg caaaaaagcg gttagctcct 5880
tcggtcctcc gatcgttgtc agaagtaagt tggccgcagt gttatcactc atggttatgg 5940
cagcactgca taattctctt actgtcatgc catccgtaag atgcttttct gtgactggtg 6000
agtactcaac caagtcattc tgagaatagt gtatgcggcg accgagttgc tcttgcccgg 6060
cgtcaatacg ggataatacc gcgccacata gcagaacttt aaaagtgctc atcattggaa 6120
aacgttcttc ggggcgaaaa ctctcaagga tcttaccgct gttgagatcc agttcgatgt 6180
aacccactcg tgcacccaac tgatcttcag catcttttac tttcaccagc gtttctgggt 6240
gagcaaaaac aggaaggcaa aatgccgcaa aaaagggaat aagggcgaca cggaaatgtt 6300
gaatactcat actcttcctt tttcaatatt attgaagcat ttatcagggt tattgtctca 6360
tgagcggata catatttgaa tgtatttaga aaaataaaca aatagggtt ccgcgcacat 6420
ttccccgaaa agtgccacct gacgtctaag aaaccattat tatcatgaca ttaacctata 6480
aaaataggcg tatcacgagg ccctttcgtc tcgcgcgttt cggtgatgac ggtgaaaacc 6540
tctgacacat gcagctcccg gagacggtca cagcttgtct gtaagcggat gccgggagca 6600
gacaagcccg tcagggcgcg tcagcgggtg ttggcgggtg tcggggctgg cttaactatg 6660
cggcatcaga gcagattgta ctgagagtgc accatatgcg gtgtgaaata ccgcacagat 6720

gcgtaaggag aaaataccgc atcaggcgcc attcgccatt caggctgcgc aactgttggg 6780

aagggcgatc ggtgcgggcc tcttcgctat tacgccagct ggcgaaaggg ggatgtgctg 6840

caaggcgatt aagttgggta acgccagggt tttcccagtc acgacgttgt aaaacgacgg 6900

cgcaaggaat ggtgcatgca aggagatggc gcccaacagt cccccggcca cggggcctgc 6960

caccataccc acgccgaaac aagcgctcat gagcccgaag tggcgagccc gatcttcccc 7020

atcggtgatg tcggcgatat aggcgccagc aaccgcacct gtggcgccgg tgatgccggc 7080

cacgatgcgt ccggcgtaga ggcgattagt ccaatttgtt aaagacagga tatcagtggt 7140

ccaggctcta gttttgactc aacaatatca ccagctgaag cctatagagt acgagccata 7200

gataaaataa aagattttat ttagtctcca gaaaaagggg ggaa 7244

<210> 11
<211> 6561
<212> DNA
<213> Artificial

<220>
<223> MSCV Vector (MSCV-U6-Puro)

<400> 11
tgaaagaccc cacctgtagg tttggcaagc tagcttaagt aacgccattt tgcaaggcat 60

ggaaaataca taactgagaa tagagaagtt cagatcaagg ttaggaacag agagacagca 120

gaatatgggc caaacaggat atctgtggta agcagttcct gccccggctc agggccaaga 180

acagatggtc cccagatgcg gtcccgccct cagcagtttc tagagaacca tcagatgttt 240

ccagggtgcc ccaaggacct gaaatgaccc tgtgccttat ttgaactaac caatcagttc 300

gcttctcgct tctgttcgcg cgcttctgct ccccgagctc aataaaagag cccacaaccc 360

ctcactcggc gcgccagtcc tccgatagac tgcgtcgccc gggtacccgt attcccaata 420

aagcctcttg ctgtttgcat ccgaatcgtg gactcgctga tccttgggag ggtctcctca 480

gattgattga ctgcccacct cgggggtctt tcatttggag gttccaccga gatttggaga 540

cccctgccca gggaccaccg acccccccgc cgggaggtaa gctggccagc ggtcgtttcg 600

tgtctgtctc tgtctttgtg cgtgtttgtg ccggcatcta atgtttgcgc ctgcgtctgt 660

actagttagc taactagctc tgtatctggc ggacccgtgg tggaactgac gagttctgaa 720

cacccggccg caaccctggg agacgtccca gggactttgg gggccgtttt tgtggcccga 780

cctgaggaag ggagtcgatg tggaatccga ccccgtcagg atatgtggtt ctggtaggag 840

acgagaacct aaaacagttc ccgcctccgt ctgaattttt gctttcggtt tggaaccgaa 900

gccgcgcgtc ttgtctgctg cagcgctgca gcatcgttct gtgttgtctc tgtctgactg 960

tgtttctgta tttgtctgaa aattagggcc agactgttac cactccctta agtttgacct 1020

taggtcactg gaaagatgtc gagcggatcg ctcacaacca gtcggtagat gtcaagaaga 1080

gacgttgggt taccttctgc tctgcagaat ggccaacctt taacgtcgga tggccgcgag 1140
acggcacctt taaccgagac ctcatcaccc aggttaagat caaggtcttt tcacctggcc 1200
cgcatggaca cccagaccag gtcccctaca tcgtgacctg ggaagccttg gcttttgacc 1260
cccctccctg ggtcaagccc tttgtacacc ctaagcctcc gcctcctctt cctccatccg 1320
ccccgtctct ccccccttgaa cctcctcgtt cgaccccgcc tcgatcctcc ctttatccag 1380
ccctcactcc ttctctaggc gccggaatta gatctttccc atgattcctt catatttgca 1440
tatacgatac aaggctgtta gagagataat tagaattaat ttgactgtaa acacaaagat 1500
attagtacaa aatacgtgac gtagaaagta ataatttctt gggtagtttg cagtttttaa 1560
aattatgttt taaaatggac tatcatatgc ttaccgtaac ttgaaagtat ttcgatttct 1620
tggctttata tatcttgtgg aaaggacgaa acacctctga ggttaacgga tccgcggccg 1680
cacgcgtgtt aacgaattct accgggtagg ggaggcgctt ttcccaaggc agtctggagc 1740
atgcgcttta gcagccccgc tgggcacttg gcgctacaca agtggcctct ggcctcgcac 1800
acattccaca tccaccggta ggcgccaacc ggctccgttc tttggtggcc ccttcgcgcc 1860
accttctact cctcccctag tcaggaagtt ccccccccgcc ccgcagctcg cgtcgtgcag 1920
gacgtgacaa atggaagtag cacgtctcac tagtctcgtg cagatggaca gcaccgctga 1980
gcaatggaag cgggtaggcc tttggggcag cggccaatag cagctttgct ccttcgcttt 2040
ctgggctcag aggctgggaa ggggtgggtc cgggggcggg ctcaggggcg ggctcagggg 2100
cggggcgggc gcccgaaggt cctccggagg cccggcattc tgcacgcttc aaaagcgcac 2160
gtctgccgcg ctgttctcct cttcctcatc tccgggcctt tcgacctgca gcccaagctt 2220
accatgaccg agtacaagcc cacggtgcgc ctcgccaccc gcgacgacgt ccccagggcc 2280
gtacgcaccc tcgccgccgc gttcgccgac taccccgcca cgcgccacac cgtcgatccg 2340
gaccgccaca tcgagcgggt caccgagctg caagaactct tcctcacgcg cgtcgggctc 2400
gacatcggca aggtgtgggt cgcggacgac ggcgccgcgg tggcggtctg gaccacgccg 2460
gagagcgtcg aagcgggggc ggtgttcgcc gagatcggcc cgcgcatggc cgagttgagc 2520
ggttcccggc tggccgcgca gcaacagatg gaaggcctcc tggcgccgca ccggcccaag 2580
gagcccgcgt ggttcctggc caccgtcggc gtctcgcccg accaccaggg caagggtctg 2640
ggcagcgccg tcgtgctccc cggagtggag gcggccgagc gcgccggggt gcccgccttc 2700
ctggagacct ccgcgccccg caacctcccc ttctacgagc ggctcggctt caccgtcacc 2760
gccgacgtcg aggtgcccga aggaccgcgc acctggtgca tgacccgcaa gcccggtgcc 2820
tgacgcccgc cccacgaccc gcagcgcccg accgaaagga gcgcacgacc ccatgcatcg 2880
ataaaataaa agattttatt tagtctccag aaaaaggggg gaatgaaaga ccccacctgt 2940

aggtttggca agctagctta agtaacgcca ttttgcaagg catggaaaat acataactga 3000

gaatagagaa gttcagatca aggttaggaa cagagagaca gcagaatatg ggccaaacag 3060

gatatctgtg gtaagcagtt cctgccccgg ctcagggcca agaacagatg gtccccagat 3120

gcggtcccgc cctcagcagt ttctagagaa ccatcagatg tttccagggt gccccaagga 3180

cctgaaatga ccctgtgcct tatttgaact aaccaatcag ttcgcttctc gcttctgttc 3240

gcgcgcttct gctccccgag ctcaataaaa gagcccacaa cccctcactc ggcgcgccag 3300

tcctccgata gactgcgtcg cccgggtacc cgtgtatcca ataaaccctc ttgcagttgc 3360

atccgacttg tggtctcgct gttccttggg agggtctcct ctgagtgatt gactacccgt 3420

cagcgggggt ctttcatggg taacagtttc ttgaagttgg agaacaacat tctgagggta 3480

ggagtcgaat attaagtaat cctgactcaa ttagccactg ttttgaatcc acatactcca 3540

atactcctga aatagttcat tatggacagc gcagaagagc tggggagaat taattcgtaa 3600

tcatggtcat agctgtttcc tgtgtgaaat tgttatccgc tcacaattcc acacaacata 3660

cgagccggaa gcataaagtg taaagcctgg ggtgcctaat gagtgagcta actcacatta 3720

attgcgttgc gctcactgcc cgctttccag tcgggaaacc tgtcgtgcca gctgcattaa 3780

tgaatcggcc aacgcgcggg gagaggcggt ttgcgtattg ggcgctcttc cgcttcctcg 3840

ctcactgact cgctgcgctc ggtcgttcgg ctgcggcgag cggtatcagc tcactcaaag 3900

gcggtaatac ggttatccac agaatcaggg gataacgcag gaaagaacat gtgagcaaaa 3960

ggccagcaaa aggccaggaa ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc 4020

cgccccctg acgagcatca caaaaatcga cgctcaagtc agaggtggcg aaacccgaca 4080

ggactataaa gataccaggc gtttcccccct ggaagctccc tcgtgcgctc tcctgttccg 4140

accctgccgc ttaccggata cctgtccgcc tttctccctt cgggaagcgt ggcgctttct 4200

catagctcac gctgtaggta tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt 4260

gtgcacgaac cccccgttca gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag 4320

tccaacccgg taagacacga cttatcgcca ctggcagcag ccactggtaa caggattagc 4380

agagcgaggt atgtaggcgg tgctacagag ttcttgaagt ggtggcctaa ctacggctac 4440

actagaagga cagtatttgg tatctgcgct ctgctgaagc cagttacctt cggaaaaaga 4500

gttggtagct cttgatccgg caaacaaacc accgctggta gcggtggttt ttttgtttgc 4560

aagcagcaga ttacgcgcag aaaaaaagga tctcaagaag atcctttgat cttttctacg 4620

gggtctgacg ctcagtggaa cgaaaactca cgttaaggga ttttggtcat gagattatca 4680

aaaaggatct tcacctagat ccttttaaat taaaaatgaa gttttaaatc aatctaaagt 4740

atatatgagt aaacttggtc tgacagttac caatgcttaa tcagtgaggc acctatctca 4800

gcgatctgtc tatttcgttc atccatagtt gcctgactcc ccgtcgtgta gataactacg 4860

atacgggagg gcttaccatc tggccccagt gctgcaatga taccgcgaga cccacgctca 4920
ccggctccag atttatcagc aataaaccag ccagccggaa gggccgagcg cagaagtggt 4980
cctgcaactt tatccgcctc catccagtct attaattgtt gccgggaagc tagagtaagt 5040
agttcgccag ttaatagttt gcgcaacgtt gttgccattg ctacaggcat cgtggtgtca 5100
cgctcgtcgt ttggtatggc ttcattcagc tccggttccc aacgatcaag gcgagttaca 5160
tgatccccca tgttgtgcaa aaaagcggtt agctccttcg gtcctccgat cgttgtcaga 5220
agtaagttgg ccgcagtgtt atcactcatg gttatggcag cactgcataa ttctcttact 5280
gtcatgccat ccgtaagatg cttttctgtg actggtgagt actcaaccaa gtcattctga 5340
gaatagtgta tgcggcgacc gagttgctct tgcccggcgt caatacggga taataccgcg 5400
ccacatagca gaactttaaa agtgctcatc attggaaaac gttcttcggg gcgaaaactc 5460
tcaaggatct taccgctgtt gagatccagt tcgatgtaac ccactcgtgc acccaactga 5520
tcttcagcat cttttacttt caccagcgtt tctgggtgag caaaaacagg aaggcaaaat 5580
gccgcaaaaa agggaataag ggcgacacgg aaatgttgaa tactcatact cttccttttt 5640
caatattatt gaagcattta tcagggttat tgtctcatga gcggatacat atttgaatgt 5700
atttagaaaa ataaacaaat aggggttccg cgcacatttc cccgaaaagt gccacctgac 5760
gtctaagaaa ccattattat catgacatta acctataaaa ataggcgtat cacgaggccc 5820
tttcgtctcg cgcgtttcgg tgatgacggt gaaaacctct gacacatgca gctcccggag 5880
acggtcacag cttgtctgta agcggatgcc gggagcagac aagcccgtca gggcgcgtca 5940
gcgggtgttg gcgggtgtcg gggctggctt aactatgcgg catcagagca gattgtactg 6000
agagtgcacc atatgcggtg tgaaataccg cacagatgcg taaggagaaa ataccgcatc 6060
aggcgccatt cgccattcag gctgcgcaac tgttgggaag ggcgatcggt gcgggcctct 6120
tcgctattac gccagctggc gaaaggggga tgtgctgcaa ggcgattaag ttgggtaacg 6180
ccagggtttt cccagtcacg acgttgtaaa acgacggcgc aaggaatggt gcatgcaagg 6240
agatggcgcc caacagtccc ccggccacgg ggcctgccac catacccacg ccgaaacaag 6300
cgctcatgag cccgaagtgg cgagcccgat cttccccatc ggtgatgtcg gcgatatagg 6360
cgccagcaac cgcacctgtg gcgccggtga tgccggccac gatgcgtccg gcgtagaggc 6420
gattagtcca atttgttaaa gacaggatat cagtggtcca ggctctagtt ttgactcaac 6480
aatatcacca gctgaagcct atagagtacg agccatagat aaaataaaag attttattta 6540
gtctccagaa aaaggggga a 6561

<210> 12
<211> 6464
<212> DNA

<213> Artificial

<220>
<223> MSCV Vector (MSCV-U6-hrGFP)

<400> 12
tgaaagaccc cacctgtagg tttggcaagc tagcttaagt aacgccattt tgcaaggcat 60
ggaaaataca taactgagaa tagagaagtt cagatcaagg ttaggaacag agagacagca 120
gaatatgggc caaacaggat atctgtggta agcagttcct gccccggctc agggccaaga 180
acagatggtc cccagatgcg gtcccgccct cagcagtttc tagagaacca tcagatgttt 240
ccagggtgcc ccaaggacct gaaatgaccc tgtgccttat ttgaactaac caatcagttc 300
gcttctcgct tctgttcgcg cgcttctgct ccccgagctc aataaaagag cccacaaccc 360
ctcactcggc gcgccagtcc tccgatagac tgcgtcgccc gggtacccgt attcccaata 420
aagcctcttg ctgtttgcat ccgaatcgtg gactcgctga tccttgggag ggtctcctca 480
gattgattga ctgcccacct cgggggtctt tcatttggag gttccaccga gatttggaga 540
cccctgccca gggaccaccg acccccccgc cgggaggtaa gctggccagc ggtcgtttcg 600
tgtctgtctc tgtctttgtg cgtgtttgtg ccggcatcta atgtttgcgc ctgcgtctgt 660
actagttagc taactagctc tgtatctggc ggacccgtgg tggaactgac gagttctgaa 720
cacccggccg caaccctggg agacgtccca gggactttgg gggccgtttt tgtggcccga 780
cctgaggaag ggagtcgatg tggaatccga ccccgtcagg atatgtggtt ctggtaggag 840
acgagaacct aaaacagttc ccgcctccgt ctgaattttt gctttcggtt tggaaccgaa 900
gccgcgcgtc ttgtctgctg cagcgctgca gcatcgttct gtgttgtctc tgtctgactg 960
tgtttctgta tttgtctgaa aattagggcc agactgttac cactccctta agtttgacct 1020
taggtcactg gaaagatgtc gagcggatcg ctcacaacca gtcggtagat gtcaagaaga 1080
gacgttgggt taccttctgc tctgcagaat ggccaacctt taacgtcgga tggccgcgag 1140
acggcacctt taaccgagac ctcatcaccc aggttaagat caaggtcttt tcacctggcc 1200
cgcatggaca cccagaccag gtcccctaca tcgtgacctg ggaagccttg gcttttgacc 1260
cccctccctg ggtcaagccc tttgtacacc ctaagcctcc gcctcctctt cctccatccg 1320
ccccgtctct ccccccttgaa cctcctcgtt cgaccccgcc tcgtatcctc cctttatcca 1380
gccctcactc cttctctagg cgccggaatt agatctttcc catgattcct tcatatttgc 1440
atatacgata caaggctgtt agagagataa ttagaattaa tttgactgta aacacaaaga 1500
tattagtaca aaatacgtga cgtagaaagt aataatttct tgggtagttt gcagttttta 1560
aaattatgtt ttaaaatgga ctatcatatg cttaccgtaa cttgaaagta tttcgatttc 1620
ttggctttat atatcttgtg gaaaggacga aacacctctg aggttaacgg atccgcggcc 1680
gcacgcgtct gtggaatgtg tgtcagttag ggtgtggaaa gtccccaggc tccccaggca 1740

ggcagaagta tgcaaagcat gcatctcaat tagtcagcaa ccaggtgtgg aaagtcccca 1800
ggctccccag caggcagaag tatgcaaagc atgcatctca attagtcagc aaccatagtc 1860
ccgcccctaa ctccgcccat cccgccccta actccgccca gttccgccca ttctccgccc 1920
catggctgac taatttttt tatttatgca gaggccgagg ccgcctctgc ctctgagcta 1980
ttccagaagt agtgaggagg ctttttgga ggcctaggct tttgcaaaaa gctcccggga 2040
tggtgagcaa gcagatcctg aagaacaccg gcctgcagga gatcatgagc ttcaaggtga 2100
acctggaggg cgtggtgaac aaccacgtgt tcaccatgga gggctgcggc aagggcaaca 2160
tcctgttcgg caaccagctg gtgcagatcc gcgtgaccaa gggcgccccc ctgcccttcg 2220
ccttcgacat cctgagcccc gccttccagt acggcaaccg caccttcacc aagtaccccg 2280
aggacatcag cgacttcttc atccagagct tccccgccgg cttcgtgtac gagcgcaccc 2340
tgcgctacga ggacggcggc ctggtggaga tccgcagcga catcaacctg atcgaggaga 2400
tgttcgtgta ccgcgtggag tacaagggcc gcaacttccc caacgacggc cccgtgatga 2460
agaagaccat caccggcctg cagcccagct tcgaggtggt gtacatgaac gacggcgtgc 2520
tggtgggcca ggtgatcctg gtgtaccgcc tgaacagcgg caagttctac agctgccaca 2580
tgcgcaccct gatgaagagc aagggcgtgg tgaaggactt ccccgagtac cacttcatcc 2640
agcaccgcct ggagaagacc tacgtggagg acggcggctt cgtggagcag cacgagaccg 2700
ccatcgccca gctgaccagc ctgggcaagc ccctgggcag cctgcacgag tgggtgtaag 2760
tcgacctgca gccaagctta tcgataaaat aaaagatttt atttagtctc cagaaaaagg 2820
ggggaatgaa agaccccacc tgtaggtttg gcaagctagc ttaagtaacg ccattttgca 2880
aggcatggaa aatacataac tgagaataga gaagttcaga tcaaggttag gaacagagag 2940
acagcagaat atgggccaaa caggatatct gtggtaagca gttcctgccc cggctcaggg 3000
ccaagaacag atggtcccca gatgcggtcc cgccctcagc agtttctaga gaaccatcag 3060
atgtttccag ggtgccccaa ggacctgaaa tgaccctgtg ccttatttga actaaccaat 3120
cagttcgctt ctcgcttctg ttcgcgcgct tctgctcccc gagctcaata aaagagccca 3180
caacccctca ctcggcgcgc cagtcctccg atagactgcg tcgcccgggt acccgtgtat 3240
ccaataaacc ctcttgcagt tgcatccgac ttgtggtctc gctgttcctt gggagggtct 3300
cctctgagtg attgactacc cgtcagcggg ggtctttcat gggtaacagt ttcttgaagt 3360
tggagaacaa cattctgagg gtaggagtcg aatattaagt aatcctgact caattagcca 3420
ctgttttgaa tccacatact ccaatactcc tgaaatagtt cattatggac agcgcagaag 3480
agctggggag aattaattcg taatcatggt catagctgtt tcctgtgtga aattgttatc 3540
cgctcacaat tccacacaac atacgagccg gaagcataaa gtgtaaagcc tggggtgcct 3600

aatgagtgag ctaactcaca ttaattgcgt tgcgctcact gcccgctttc cagtcgggaa 3660
acctgtcgtg ccagctgcat taatgaatcg gccaacgcgc ggggagaggc ggtttgcgta 3720
ttgggcgctc ttccgcttcc tcgctcactg actcgctgcg ctcggtcgtt cggctgcggc 3780
gagcggtatc agctcactca aaggcggtaa tacggttatc cacagaatca ggggataacg 3840
caggaaagaa catgtgagca aaaggccagc aaaaggccag gaaccgtaaa aaggccgcgt 3900
tgctggcgtt tttccatagg ctccgccccc ctgacgagca tcacaaaaat cgacgctcaa 3960
gtcagaggtg gcgaaacccg acaggactat aaagatacca ggcgtttccc cctggaagct 4020
ccctcgtgcg ctctcctgtt ccgaccctgc cgcttaccgg atacctgtcc gcctttctcc 4080
cttcgggaag cgtggcgctt tctcatagct cacgctgtag gtatctcagt tcggtgtagg 4140
tcgttcgctc caagctgggc tgtgtgcacg aacccccccgt tcagcccgac cgctgcgcct 4200
tatccggtaa ctatcgtctt gagtccaacc cggtaagaca cgacttatcg ccactggcag 4260
cagccactgg taacaggatt agcagagcga ggtatgtagg cggtgctaca gagttcttga 4320
agtggtggcc taactacggc tacactagaa ggacagtatt tggtatctgc gctctgctga 4380
agccagttac cttcggaaaa agagttggta gctcttgatc cggcaaacaa accaccgctg 4440
gtagcggtgg tttttttgtt tgcaagcagc agattacgcg cagaaaaaaa ggatctcaag 4500
aagatccttt gatcttttct acggggtctg acgctcagtg gaacgaaaac tcacgttaag 4560
ggattttggt catgagatta tcaaaaagga tcttcaccta gatcctttta aattaaaaat 4620
gaagttttaa atcaatctaa agtatatatg agtaaacttg gtctgacagt taccaatgct 4680
taatcagtga ggcacctatc tcagcgatct gtctatttcg ttcatccata gttgcctgac 4740
tccccgtcgt gtagataact acgatacggg agggcttacc atctggcccc agtgctgcaa 4800
tgataccgcg agacccacgc tcaccggctc cagatttatc agcaataaac cagccagccg 4860
gaagggccga gcgcagaagt ggtcctgcaa ctttatccgc ctccatccag tctattaatt 4920
gttgccggga agctagagta agtagttcgc cagttaatag tttgcgcaac gttgttgcca 4980
ttgctacagg catcgtggtg tcacgctcgt cgtttggtat ggcttcattc agctccggtt 5040
cccaacgatc aaggcgagtt acatgatccc ccatgttgtg caaaaaagcg gttagctcct 5100
tcggtcctcc gatcgttgtc agaagtaagt tggccgcagt gttatcactc atggttatgg 5160
cagcactgca taattctctt actgtcatgc catccgtaag atgcttttct gtgactggtg 5220
agtactcaac caagtcattc tgagaatagt gtatgcggcg accgagttgc tcttgcccgg 5280
cgtcaatacg ggataatacc gcgccacata gcagaacttt aaaagtgctc atcattggaa 5340
aacgttcttc ggggcgaaaa ctctcaagga tcttaccgct gttgagatcc agttcgatgt 5400
aacccactcg tgcacccaac tgatcttcag catcttttac tttcaccagc gtttctgggt 5460
gagcaaaaac aggaaggcaa aatgccgcaa aaaagggaat aagggcgaca cggaaatgtt 5520

gaatactcat actcttcctt tttcaatatt attgaagcat ttatcagggt tattgtctca 5580

tgagcggata catatttgaa tgtatttaga aaaataaaca aataggggtt ccgcgcacat 5640

ttccccgaaa agtgccacct gacgtctaag aaaccattat tatcatgaca ttaacctata 5700

aaaataggcg tatcacgagg ccctttcgtc tcgcgcgttt cggtgatgac ggtgaaaacc 5760

tctgacacat gcagctcccg gagacggtca cagcttgtct gtaagcggat gccgggagca 5820

gacaagcccg tcagggcgcg tcagcgggtg ttggcgggtg tcggggctgg cttaactatg 5880

cggcatcaga gcagattgta ctgagagtgc accatatgcg gtgtgaaata ccgcacagat 5940

gcgtaaggag aaaataccgc atcaggcgcc attcgccatt caggctgcgc aactgttggg 6000

aagggcgatc ggtgcgggcc tcttcgctat tacgccagct ggcgaaaggg ggatgtgctg 6060

caaggcgatt aagttgggta acgccagggt tttcccagtc acgacgttgt aaaacgacgg 6120

cgcaaggaat ggtgcatgca aggagatggc gcccaacagt cccccggcca cggggcctgc 6180

caccataccc acgccgaaac aagcgctcat gagcccgaag tggcgagccc gatcttcccc 6240

atcggtgatg tcggcgatat aggcgccagc aaccgcacct gtggcgccgg tgatgccggc 6300

cacgatgcgt ccggcgtaga ggcgattagt ccaatttgtt aaagacagga tatcagtggt 6360

ccaggctcta gttttgactc aacaatatca ccagctgaag cctatagagt acgagccata 6420

gataaaataa aagattttat ttagtctcca gaaaaagggg ggaa 6464

<210> 13
<211> 62
<212> DNA
<213> Artificial

<220>
<223> p38 target gene insert

<400> 13
ccggtgcagg agttgaacaa gacaatacct gattgtcttg ttcagctcct gctttttgga 60

ag 62

<210> 14
<211> 100
<212> DNA
<213> Artificial

<220>
<223> H1 promoter sequence

<400> 14
ccctttctca ccagagtatg tcttgaatat tctaagggtt taggtttctg taaagtgcaa 60

ataccactaa agggtcttgt gtatcgctgt acgtttataa 100